1.(1 pt) If $f(x) = 5\ln(6+x)$, find $f'(x)$.

Find $f'(5)$.

2.(1 pt) Let

$$f(x) = 2\ln(2x)$$

$f'(x) =$ _____
$f'(4) =$ _____

3.(1 pt) Let

$$f(x) = \ln(x^8)$$

$f'(x) =$ _____
$f'(e^4) =$ _____

4.(1 pt) Let

$$f(x) = [\ln x]^4$$

$f'(x) =$ _____
$f'(e^3) =$ _____

5.(1 pt) If $f(x) = 2\sqrt{x}\ln(x)$, find $f'(x)$.

Find $f'(3)$.

6.(1 pt) Let

$$f(x) = 2x^3 \ln x$$

$f'(x) =$ _____
$f'(e^2) =$ _____

7.(1 pt) If $f(x) = 5\cos(2\ln(x))$, find $f'(x)$.

Find $f'(5)$.

8.(1 pt) If $f(x) = 6\ln(7x+7\ln(x))$, find $f'(x)$.

Find $f'(5)$.

9.(1 pt) If $f(x) = 3\log_2(x)$, find $f'(4)$.

10.(1 pt) Let

$$f(x) = 4\log_5(x)$$

$f'(x) =$ _____
$f'(5) =$ _____

11.(1 pt) Let

$$f(x) = 9^x \log_2(x)$$

$f'(x) =$ _____

12.(1 pt) Find the indicated derivatives.

(a) $\frac{d}{dx}\left(e^{x^4} + \log_4(\pi)\right) =$ _____

(b) $\frac{d}{dx}\left((\sqrt[4]{x})^{\ln(x)}\right) =$ _____

13.(1 pt) Let

$$f(x) = \ln[x^2(x+9)^6(x^2+9)^4]$$

$f'(x) =$ _____

14.(1 pt) Let

$$f(x) = \frac{x^7(x-7)^5}{(x^2+4)^6}$$

Use logarithmic differentiation to determine the derivative.

$f'(x) =$ _____
$f'(7) =$ _____

15.(1 pt) If $f(x) = (6x-4)^4 * (7x^2+8)^2$, find $f'(2)$.

16.(1 pt) Let

$$f(x) = \ln\sqrt{\frac{6x-7}{5x+3}}$$

$f'(x) =$ _____

17.(1 pt) Let

$$f(x) = x^{3x}$$

Use logarithmic differentiation to determine the derivative.

$f'(x) =$ _____
$f'(1) =$ _____

18.(1 pt) If $f(x) = 2x^{4x}$, find $f'(2)$.

19.(1 pt) If $f(x) = 2\sin(x) + 2x^x$, find $f'(2)$.

20.(1 pt) If $f(x) = 10(\sin(x))^x$, find $f'(1)$.

21.(1 pt) If $f(x) = 4x^{\ln(x)}$, find $f'(10)$.

22.(1 pt) Let

$$y = x^{\log_4(x)}$$

Then

$\frac{dy}{dx} =$ _____

Note. You must express your answer in terms of natural logs, as Webwork doesn't understand how to evaluate logarithms to other bases.

23.(1 pt) Find $\frac{dy}{dx}$ for each of the following functions

$$y = \ln\left(\frac{3x-5}{x\sqrt[5]{x^2+1}}\right)$$

$\frac{dy}{dx} =$ _____

$$y = x^{\cos(x)}$$

$\frac{dy}{dx} =$ _____